The criticality of an integrated Educational Technology architecture

in the business of teaching and learning

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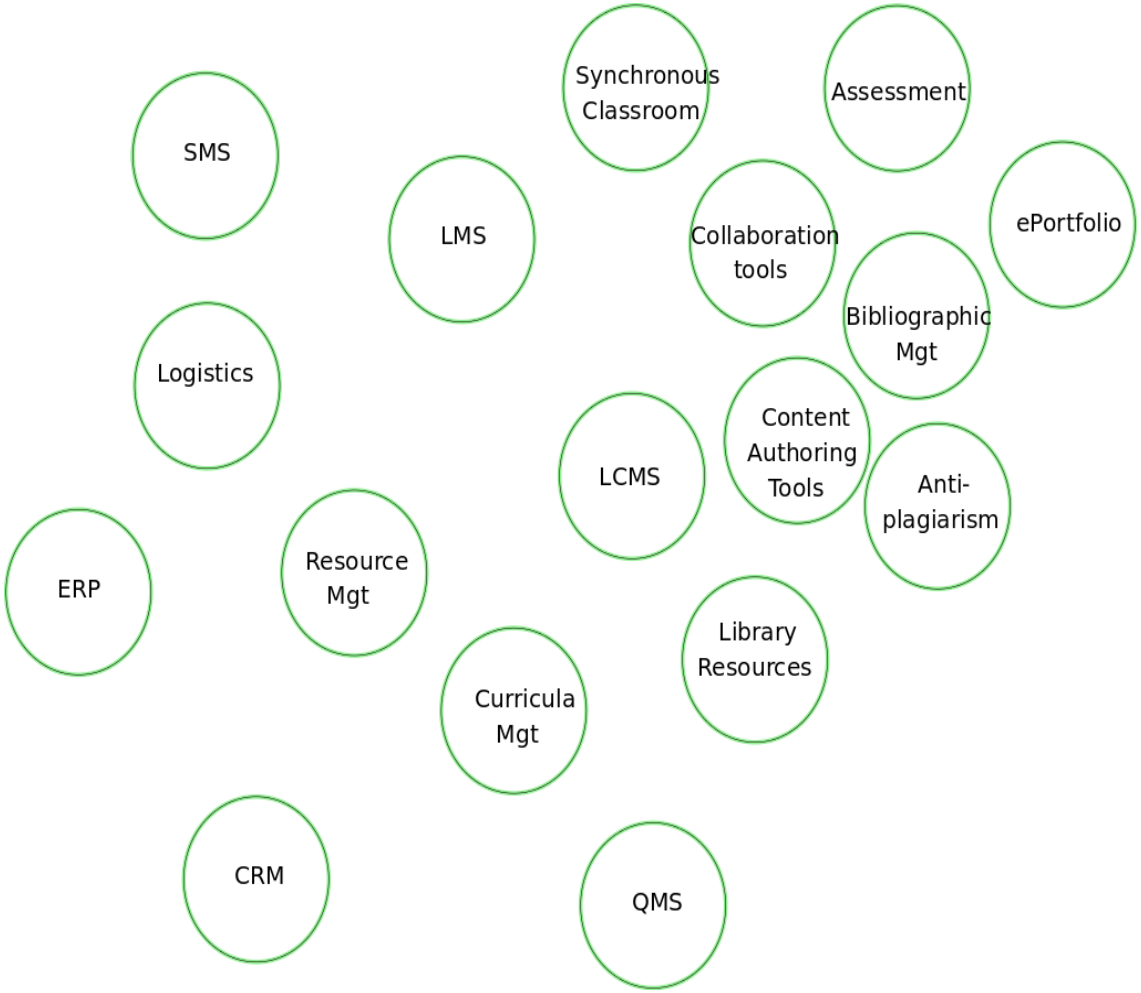
Outline

- Challenges conceiving, designing and implementing a robust and efficient Educational Technology Systems Architecture
- The historical context
- Traps and pitfalls
- Integration technologies
- Changing architectural landscape
- The future: architectural impacts arising from content management developments such as Equella

Why is good systems architecture important?

- Inevitable a requirement for the exchange of information across systems
- If not present then each system will be less capable of completing its task
- Technology should be an enabler
- Poor systems integration = poor usability
- Good architecture = agility
- Room for improvement

The emergence of Educational Technologies at a systems level



Systems commoditisation and the impact on architecture

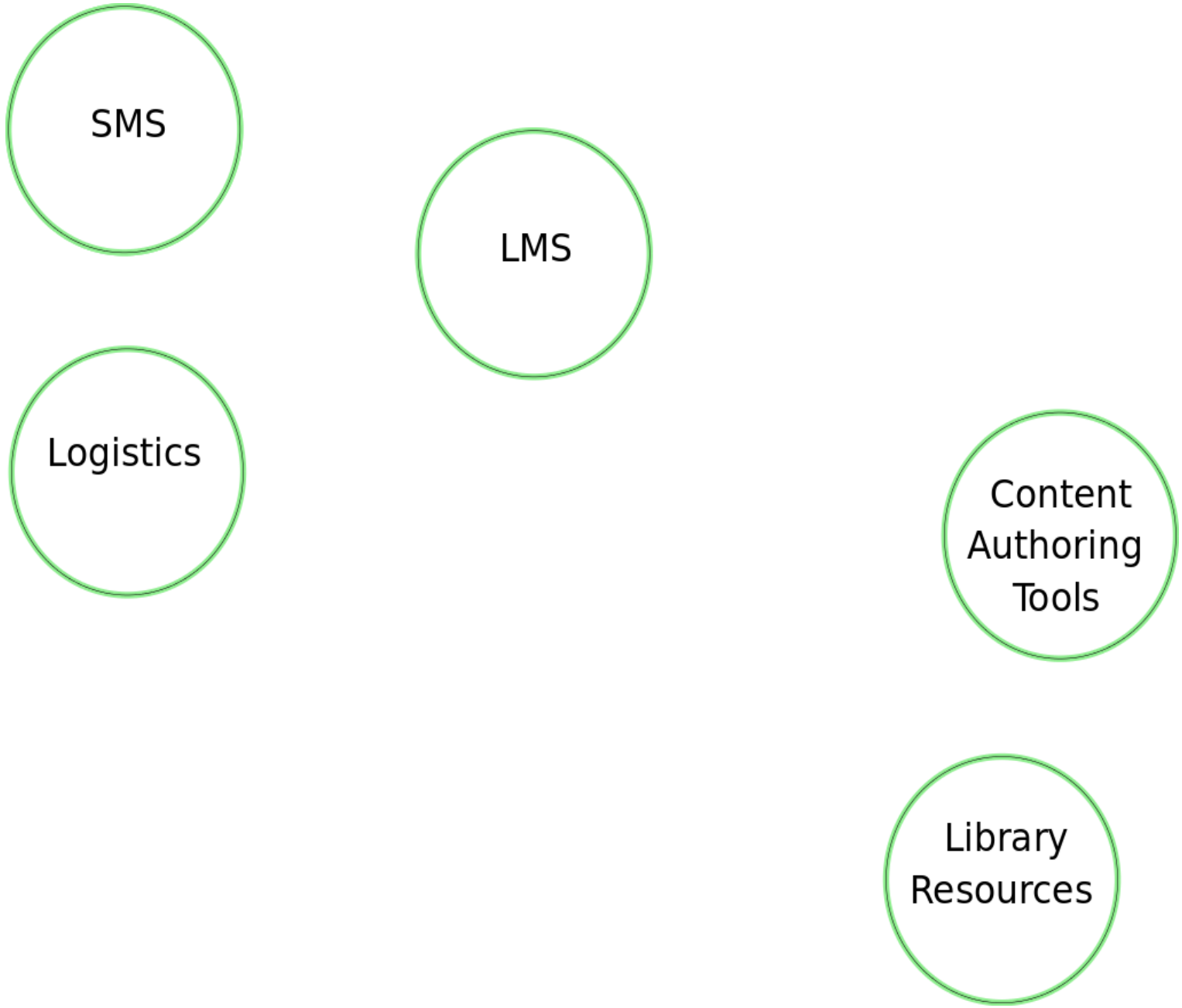
- System commoditisation impacts on systems integration architecture
- Software vendors must follow user expectations and conform to the functional requirements
- If development is of a different system, outside of a related but highly commoditised application, it is then likely that integration with that application will be compelling e.g. LCMSs with LMSs

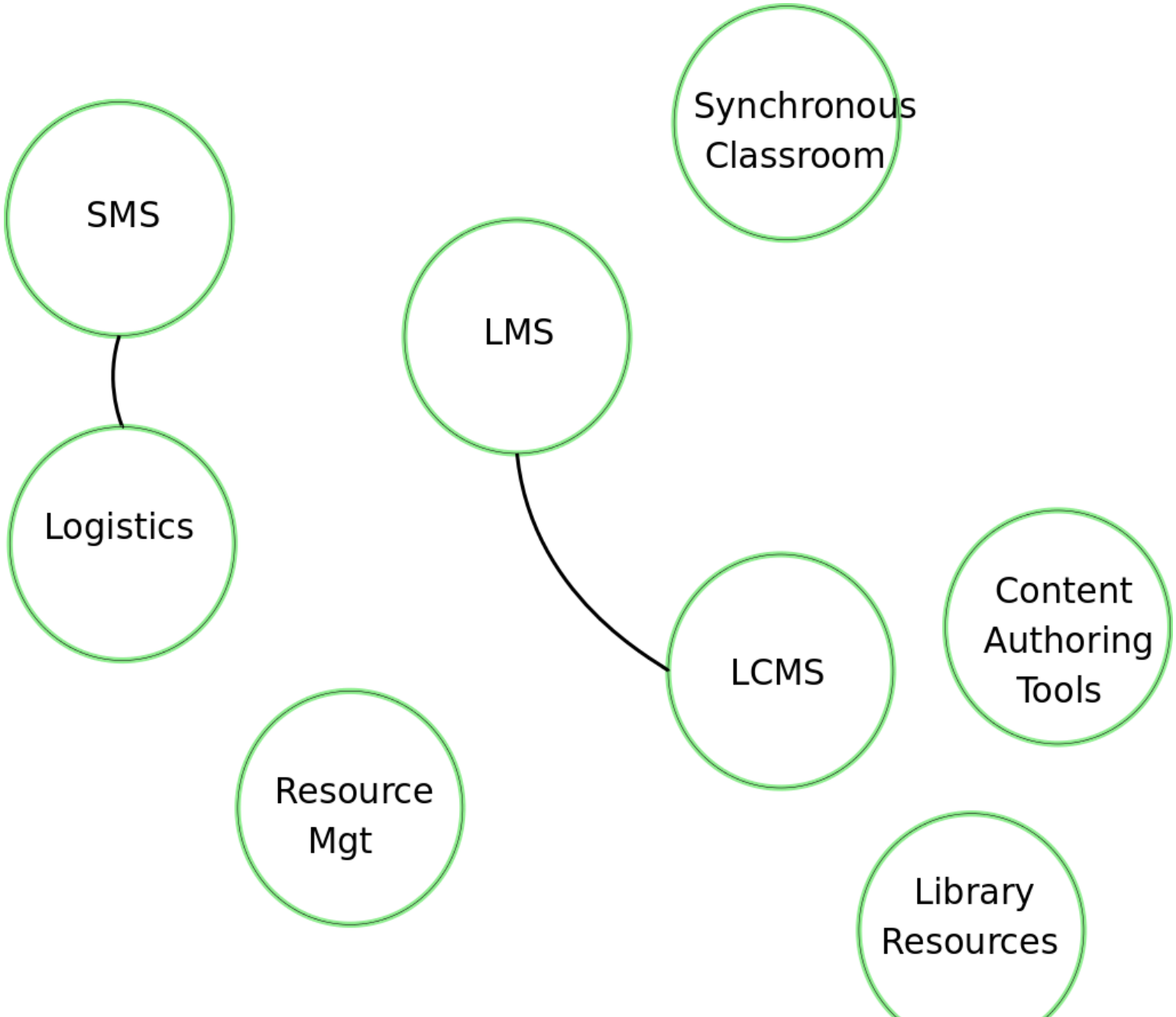
The toaster vs bread maker

Difficulty in good Educational Technology Systems Architecture

- Historical context of recently emergent technologies
- Key Educational Technology applications developed independent of broader context
- Technology not core competence
- IT resources in the sector revolve around desktop and communications
- Underestimate the effort required in an integration project and/or fail to assign the right resources
- Piecemeal implementations

An historical evolution


SMS
LMS
Logistics
Content Authoring Tools
Library Resources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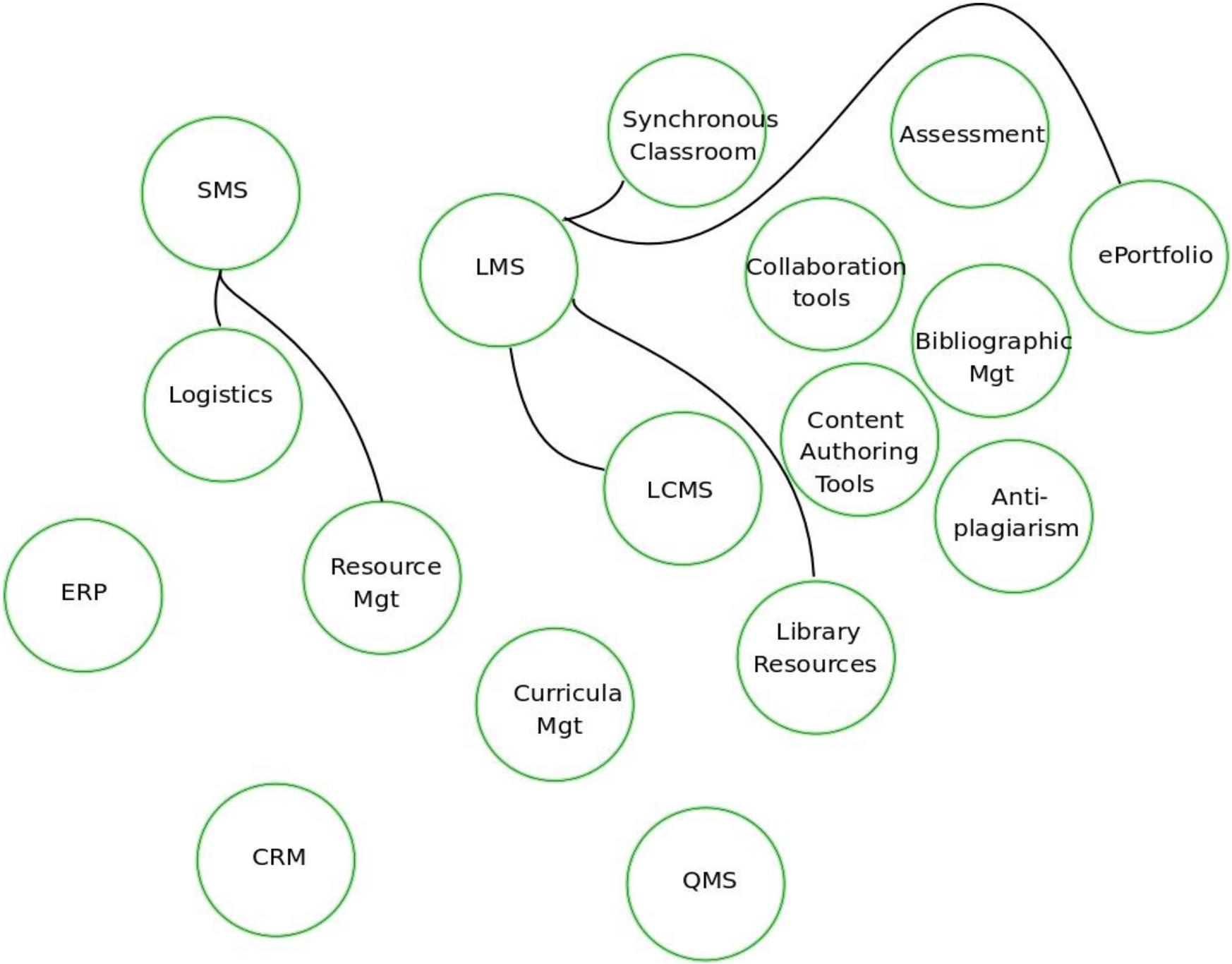
LMS
LCMS
Content Authoring Tools
Resource Mgt
Library Resources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QMS
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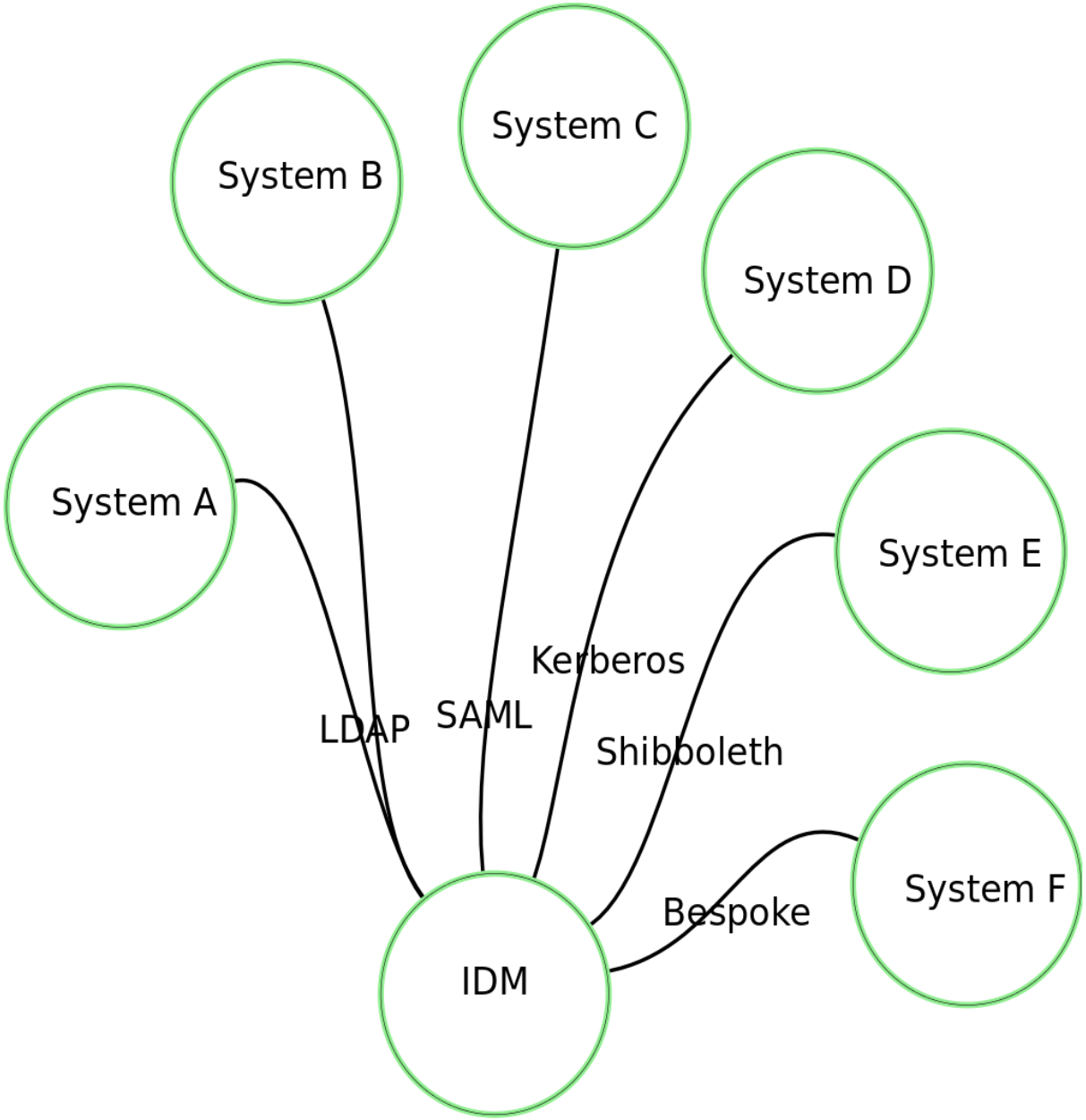
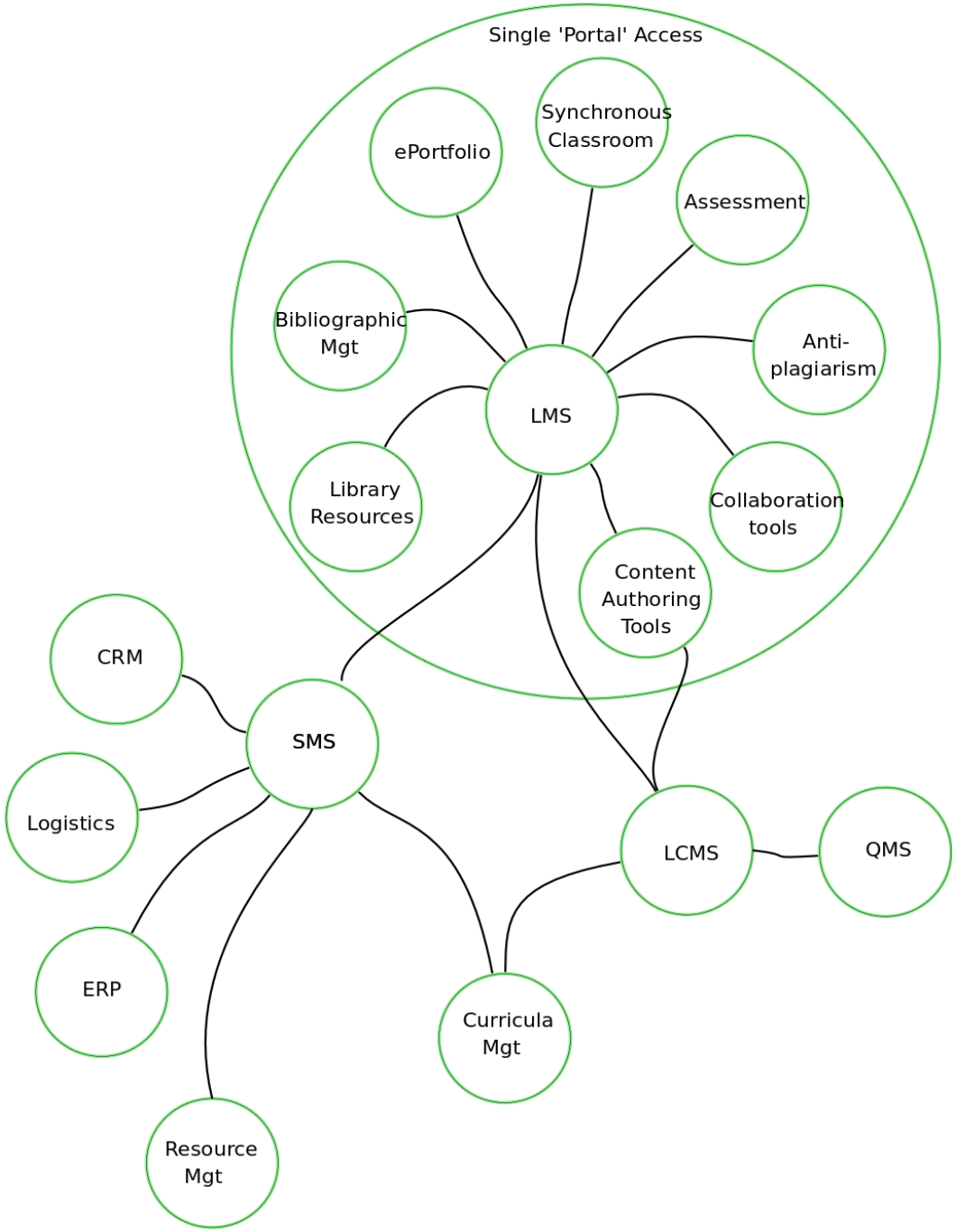
ePortfolio
Collaboration tools
Bibliographic Mgt
Content Authoring Tools
Anti-plagiarism
Library Resources


System B
System C
System D
System A
System E
Kerberos
LDAP
SAML
Shibboleth
System F
Bespoke
IDM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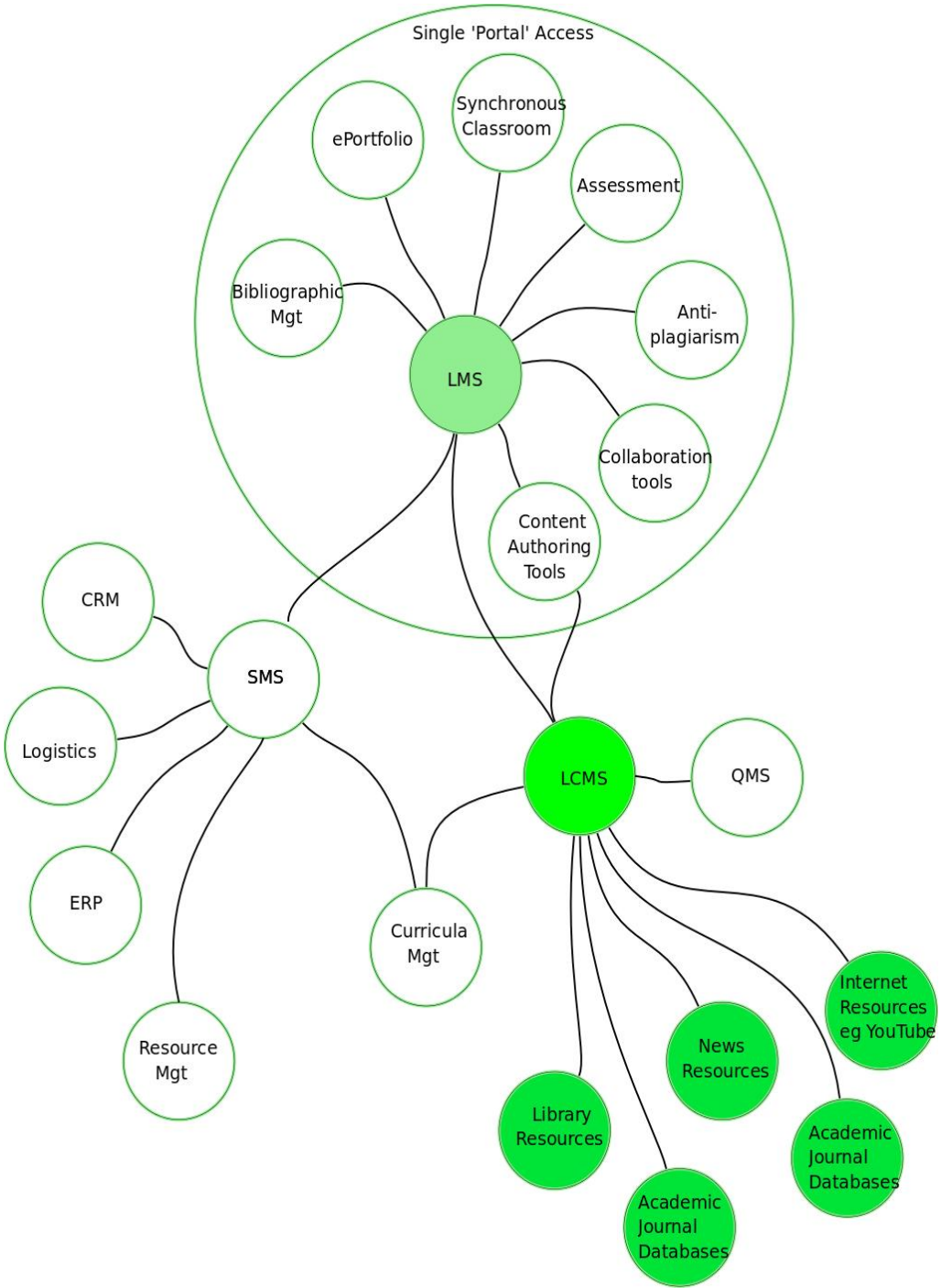
Sample integration technologies

- Range of technology standards available for inter-system integration: e.g.
- Standards used with library systems:
- Z39.50, Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), Metadata Encoding and Transmission Standard (METS)
- Learning content and learning content delivery systems
- Shareable Content Object Reference Model (SCORM) including: IMS Content Aggregation Mode, Run-Time Environment, Sequencing and Navigation
- User authentication: Lightweight Directory Access Protocol (LDAP), Kerberos, Shibboleth, Security Assertion Markup Language (SAML)
- Generic integration technologies e.g. Extensible Markup Language Remote Procedure Call (XMLRPC) and SOAP (originally 'Simple Object Access Protocol), Public Key Infrastructure (PKI), domain/IP address based trusted referral
- Flat-file transfers
- Choose wisely and be informed

A look to the future:

recent impacts of Content Management and content federation on architecture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Library Resources
Academic Journal Databases
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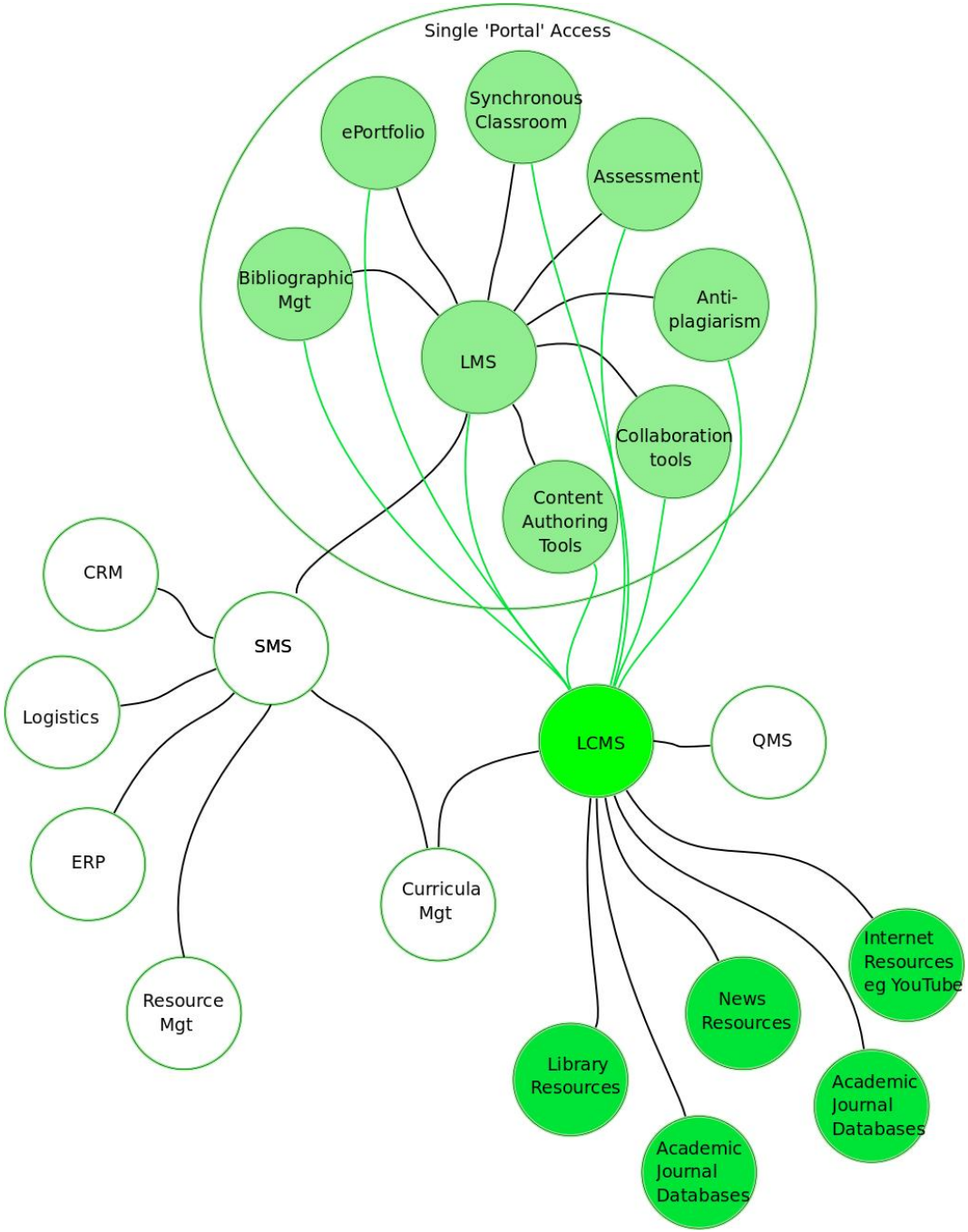
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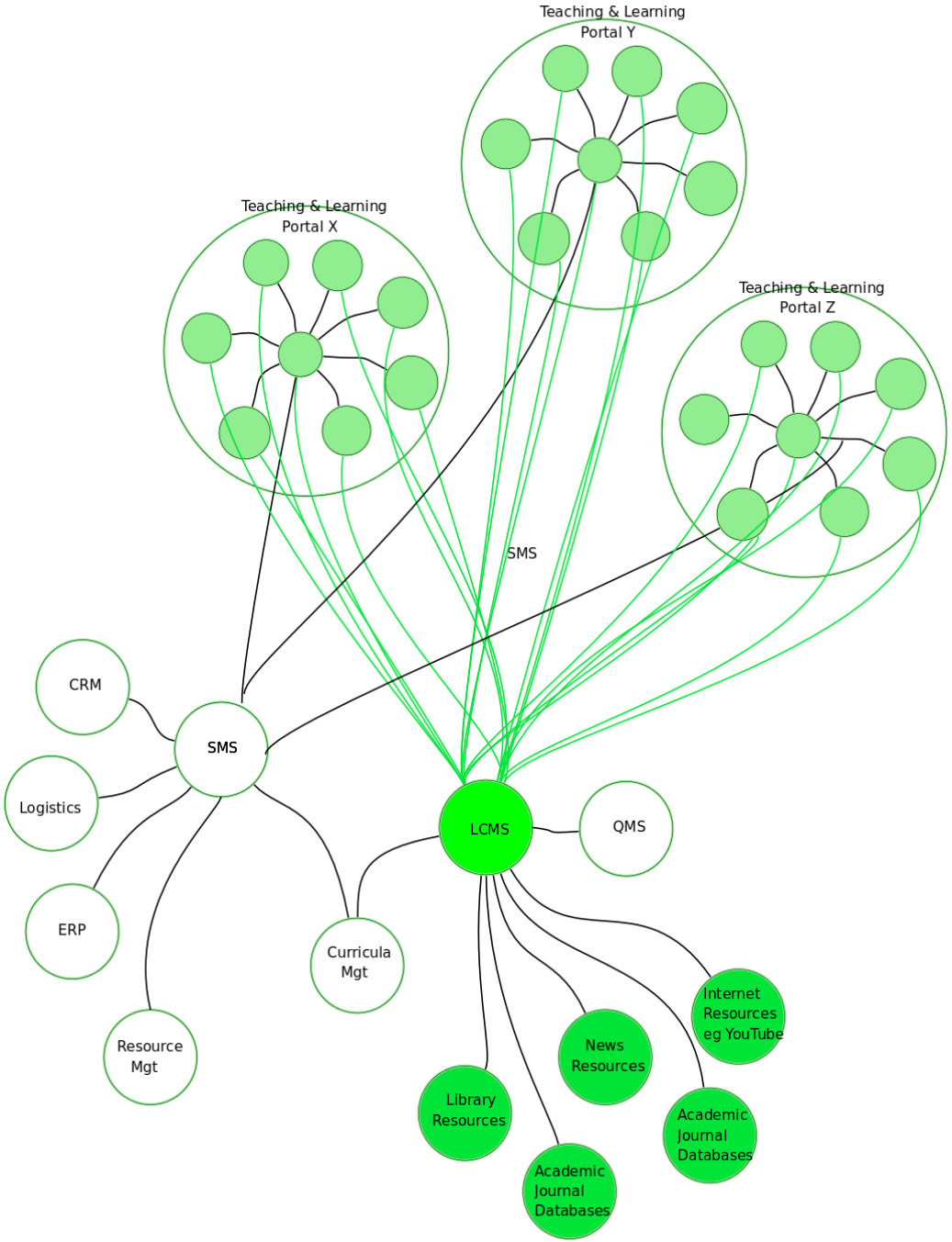
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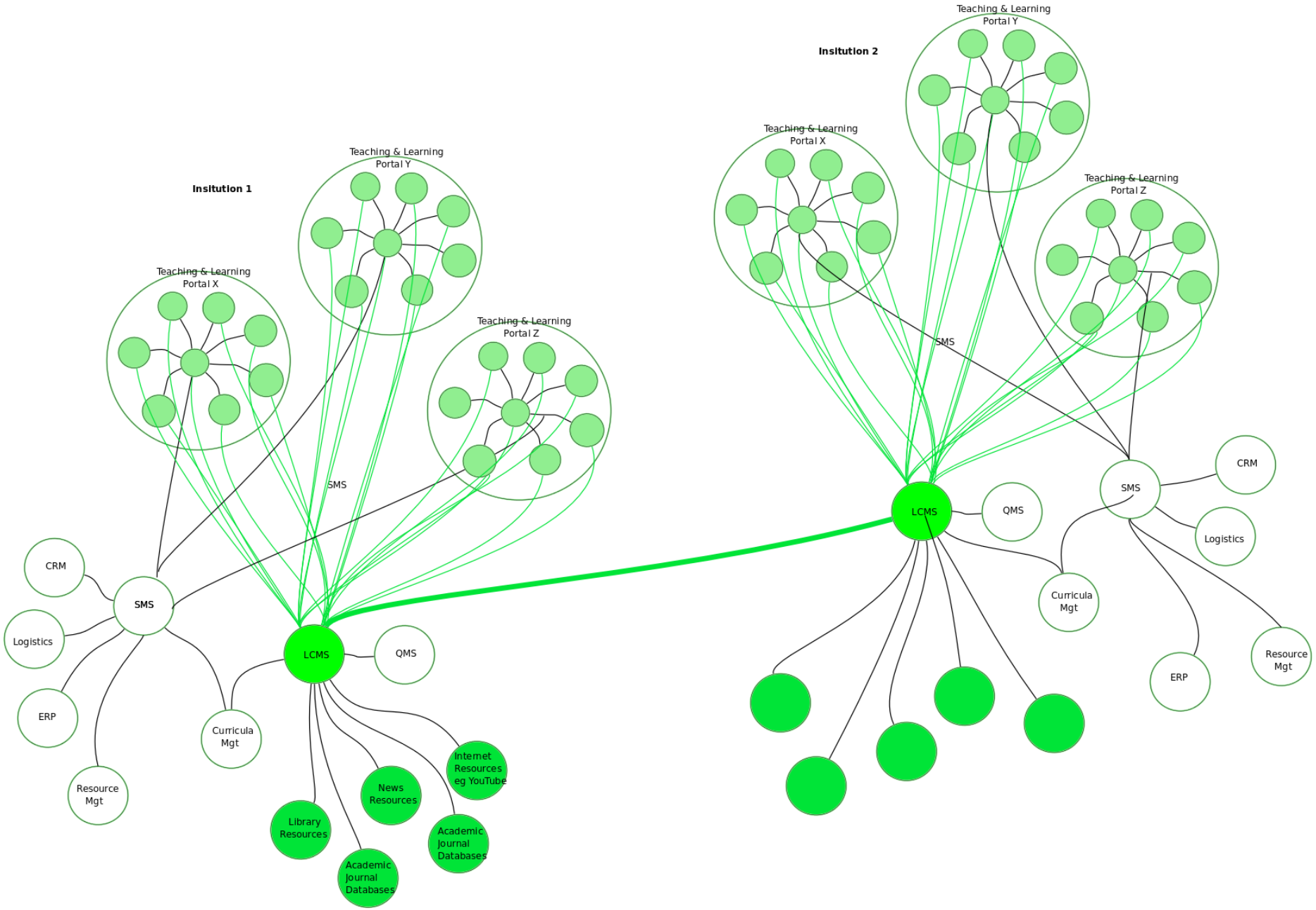
eg YouTube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Conclusions

- Good Educational Technology Systems Architecture is hard
- Disciplines are too new
- Huge complexity
- Understand the challenges: simplify
- Take strategic view of systems and how the interoperate
- Beginning of a long journey
- Complexity ahead greater than what lies behind.
- Standards and technologies developing
- Opportunities for growth are immense e.g. Equella in content management
- Some institutions will be left far behind

Conclusions

The key is to recognise the evolutionary path and to actively pursue it both strategically and tactically.

To fail to do so is almost certainly to fail more broadly.

Question & answer